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Introduction

Congratulations on your purchase of the Radium, part of the USB Keystation series of MIDI controllers brought to you by M-Audio. You may use your Radium in conjunction with a USB equipped PC or Macintosh computer and appropriate music software to enter a full range of MIDI note and controller information. You will be able to discover the wonderful world of Computer Music with a set of complete musical instruments from your sound card, sound modules, or workstation. The Radium gives you full control over MIDI parameters, while utilizing proven M-Audio USB MIDI interface technology. The Radium will also serve your needs as a standalone MIDI controller.

This manual will help you become familiar with the powerful features of the Radium. After reading the manual carefully, you will have a clear understanding of how to transmit different MIDI messages to other instruments and equipment. For ease of use of MIDI implementation, we strongly recommend that you have the manual at hand when you are using the keyboard, especially if you are new to the world of MIDI.

What's in the Box

Included in your Radium, you should find:

1. Radium USB Keystation MIDI Controller
2. One (1) standard USB cable
3. PC/Mac Driver CD
4. This manual and warranty registration card

Radium Features

The Radium MIDI controller keyboard provides either 61 or 49 dynamic keys, pitch and mod wheels, a data slider, 8 assignable sliders and 8 assignable knobs.

- Connects easily to your computer—no tools or disassembly required
- When used with USB, may be parasitically powered by your computer's USB port
- May be used as a completely portable standalone controller when powered by a 9VDC external power supply (or internal battery, Radium49 only)
- Provides two MIDI OUT jacks for sending MIDI to external devices via computer or as standalone MIDI controller
- Footswith jack provided for sustain pedal (pedal optional)
- Offers a great variety of useful MIDI functions, even though containing no built-in sound capabilities

An Overview

The Radium is a fully functional MIDI controller. Its touch-sensitive keys can be set to play any octave or transposed pitch, while the Radium's pitch wheel, mod wheel and data slider with the addition of sixteen programmable rotary knobs and sliders make it the most versatile MIDI controller of its class. Its compact size and powerful controller features make it the ultimate in portable keyboard controllers. Virtually any type of MIDI controller information can be sent from the Radium to your computer, using the power and convenience of the Mac or PC computer's USB port. Additionally, the Radium can operate as a "standalone" MIDI controller, independent of the computer. The rear panel MIDI port marked "keyboard" is used for this purpose.

Contained within the Radium is a USB MIDI interface. Simply plug the Radium into your computer's USB port, install the included drivers and enable the MIDI interface within your music software. This combination of a versatile keyboard controller and a USB MIDI interface allows you record and control MIDI information within your music application, plus adds a MIDI output port to which you can connect a MIDI sound module or drum machine. The rear panel MIDI port marked "USB" is used for this purpose.

The Radium may be powered by one of two sources: an external power supply or "parasitically" from the voltage it receives from the USB port. For the most consistent performance, we recommend using a power supply, even when using the Radium with your computer's USB port. To power from the USB port only, plug the Radium directly into the computer's USB port, not a powered USB hub. When using the Radium in standalone mode, a power supply must be used. When using an external power supply (optional), it is important to use only a supply with the proper 9vDC, 500ma rating. This may be purchased locally or through M-Audio.

On a PC: You must be running Windows 98 or higher to properly use the Radium. Windows NT is not supported. Also, your motherboard must support USB 1.1. It is possible for a motherboard to support USB and yet not have the physical port connectors installed. A simple USB back panel extender can be purchased at a computer supply store and can be installed easily to provide USB port connectors.

On an Apple Computer: Your Mac must support USB with the built-in ports. The USB ports on the iMac or PowerMac G3/G4 will work just fine. A Mac OS that supports USB will also be required. We recommend MacOS 9.2.2 or higher. We cannot guarantee performance of device when using non-Apple USB ports.

> **IMPORTANT: For MacOS 9, an OMS MIDI driver is provided. You MUST have a sequencer program that supports OMS, and have OMS properly installed in order to use the Radium.**

A Guide to Getting Started

An outline of the steps needed to begin using your Radium on either a Mac or PC:

1. Attach the Radium to your computer (see "Hardware Installation").
2. Install the Driver (see "Software Installation").
3. Hook your sound module to the Radium (see "Setting Up Your MIDI Studio").
4. Configure the Radium in your application software (see "Using the Radium in your Application Software").

Hardware Installation

Installing your Radium involves simply attaching it to your USB port using the standard USB cable that is included. We recommend that you power down (turn off) your computer for a first time installation. If you are using the Radium in USB mode, a power supply is not required. The computer's USB port provides the power to run the Radium. The "wall-wart" supply is only necessary for use in the standalone mode. However, when the Radium receives its power from the USB port, we recommend either plugging directly into the computer's USB port (not into the keyboard's port or a powered USB hub). If you own the Radium 49, you may also power it using 6 size C batteries.

Find a good spot around your computer station to place the Radium. The USB port on your computer is a small (1/8" x 3/8"), rectangular connector (A) and is usually found in a group of two. The other end (B) of your USB cable is 'more square' (1/4" x 1/4") in shape, and should fit easily into the USB connector on your Radium. Take the (A) end of the USB cable and plug it into the USB port on the back of your computer. Take the (B) end of the USB cable and plug it in to the USB port on the back panel of the Radium. Next, power up your computer and proceed to the next section, "Software Installation."

Software Installation

MIDI application software communicates with devices such as the MIDI interface contained within the Radium via software known as "drivers." This software driver is a special, dedicated program that makes a MIDI interface accessible to an application. On the included driver disk, M-Audio supplies the drivers that enable you to use Radium with either Windows, Mac OS9 or Mac OSX. Radium drivers are supplied on the included dual format CD.

USB Driver Installation for Windows

This driver for the Radium USB interface requires Windows 98 or higher. Please make sure that Windows 98, Me, 2000 or XP is installed on your system, and that your USB port is enabled. Check your computer manual for more information.

Windows 98

1. Connect the Radium to your computer's USB port and power the Radium keyboard up to the USB power position. The computer will update its database as it looks for drivers. After doing so, your computer will identify the Keystation as a USB device. Click "Next".
2. Windows Hardware Wizard will ask you what you want to do next. The "Search for the best Driver for your Device" should already be checked—if not, do so now. Click "Next" and then insert the CD-ROM driver disk into your CD-ROM drive.
3. Windows will ask you for the location of the driver; uncheck all boxes except, "Specify Location" and click "Browse."
4. Select the appropriate drive letter for your computer's CD-ROM drive, then select the Keystation folder. Click on the Win98SE folder to open it, then click "OK."
5. Now the location is specified in the "Add New Hardware Wizard Screen." Click Next.
6. Windows will load the USB MIDI 1x1 Keystation Loader Driver, when it has found it, Windows will state that it is now ready to install this driver. Click "Next."
7. The final Window of this part of the installation process will show that the driver has been installed. Click "Finish."
8. Next, Windows will find an additional USB Device and label it "Unknown Device." Click "Next" to continue.
9. Windows Hardware Wizard will ask you what you want to do next. The "Search for the best Driver for your Device" should already be checked. Click "Next"
10. Windows will ask you for the location of the driver, uncheck all boxes except "Specify Location" and click "Browse."
11. Using the Windows Explorer menu, navigate to your CD-ROM drive and open the Keystation Folder. Select Win98SE to open the folder and click "OK".
12. Windows will now state that is has found the USB MIDI 1x1 Driver and is ready to install this driver. Click "Next" to continue.
13. Windows will load the driver and report that it is finished. Click Finish to end the installation.

Windows Me

1. Insert the Keystation Drivers CD into your PC's CD ROM drive. Connect the Radium to your computer's USB port and power the Radium keyboard up to the USB power position. The computer will update its database as it looks for drivers.
2. Windows' "Add New Hardware Wizard" will come up. Select "Search for a suitable driver for my device. (Recommended) and then click "Next" to continue.
3. Select CD-ROM under "Optional Search Locations," and then click "Next" to continue.
4. Windows will report that it has found the driver for this device. Click "Next" to continue.
5. Windows will next askyou to repeat steps 2 through 4. Do so, now.
6. Windows will state that it has finished installing the new hardware device. Simply Click "Finish" to complete the installation.

Windows 2000

1. Insert the Keystation Drivers CD into your PC's CD ROM drive. Connect the Radium to your PC's USB port and power the Radium keyboard up to the USB power position. The computer will update its database as it looks for drivers.
2. After doing so, the Add New Hardware wizard will prompt that it has found a USB device. Select "Search for a suitable driver for my device. (Recommended) then click "Next" to continue.
3. Select CD-ROM under "Optional Search Locations", click "Next" to continue.
4. Windows will report that it has found the driver for this device, click "Next" to continue.
5. When prompted, click "Yes" to continue.
6. Windows will next ask you to repeat steps 2 through 5. Do so, now.
7. Click "Finish" to complete the installation.

Windows XP

1. Insert the Keystation Drivers CD into your PC's CD ROM drive. Connect the Radium to your computer's USB port and power the Radium keyboard up to the USB power position. The first item you will see in Windows XP is a little balloon that pops up from the taskbar in the lower right hand corner.
2. The Add New Hardware wizard will prompt that it has found a USB Controller. Click "Next" to continue.
3. When prompted, click "Continue Anyway" to continue.
4. Windows will search the computer's CD-ROM drive and install the necessary files.
5. Click "Finish" to complete the installation.
6. In order to complete the installation, you must now repeat steps 2 through 5 TWO TIMES, and then re-boot your computer.

Mac OS 9

USB Driver Installation

You must first install Opcode's OMS. This is available on the MIDISPORT drivers page of our website, or can be installed from the driver CD by opening the OMS folder and then double clicking the OMS install icon.

This release version of the Radium driver requires Macintosh operating system OS 9.2.2 or higher. Some updates are offered free to Apple owners. Please check the Apple website at http://www.info.apple.com for update information.

OMS is a MIDI manager program developed by Opcode. We have included it on the CD disk for your convenience, and also offer it as a free download from our website's MIDISPORT drivers page. OMS is required to run the Radium on the Macintosh, and it is important that you install OMS before running the Radium Installer. Locate the OMS installer program on this CD in the OMS 2.3.8 folder,

and simply double click its icon to install OMS. After installing OMS, you will need to restart. Once installation has been successfully completed, you can move on to the next step, the KEYSTATION Installer.

NOTE FOR FIRST TIME INSTALLATIONS: If you power up your Mac with the Radium attached and powered up, you will receive a message that an "unknown USB device has been detected." Click OK and proceed with the driver installation. You may also install the drivers first, and then plug in the Radium.

KEYSTATION Installer

1. Insert the Driver Software CD. Open the KEYSTATION folder, then the USB folder. There, you will find the KEYSTATION Installer program.
2. Run the KEYSTATION Installer by double clicking on it. This installs all of the KEYSTATION's extensions as well as the KEYSTATION OMS Driver. However, YOU MUST HAVE OMS INSTALLED FIRST BEFORE YOU RUN THIS INSTALLER PROGRAM. Otherwise, the KEYSTATION OMS Driver will not be placed in the OMS folder.

Once installed, you should have one new extension in your Extensions folder (the Extensions folder is inside your System folder). This file is named "M-Audio USB Support." The installer will also place the file "M-Audio OMS Support" in the OMS folder, which also resides in your system folder. It is now time to configure OMS.

Go to the Chooser under the Apple Menu, and make sure AppleTalk is turned off (this is recommended, even though OMS will sense that it is on and prompt you to turn it off). Unless you have previously installied the KEYSTATION driver and OMS, and configured OMS, you must do so now, by completing the steps listed in the following section.

First Time OMS Configuration Instructions

1. In the Opcode folder, which you will find on your hard drive, locate the OMS Applications folder, then OMS Setup. Double click on OMS Setup.
2. OMS will inform you that it has not yet been configured. Click OK.
3. The Create A New Studio Setup dialog box now appears. Click OK.
4. The "OMS Driver Search" box asks you to choose the port on which you've attached the Radium (either Modem or Printer). DO NOT choose a port (since we're using USB), just click "Search." OMS begins Searching.

IMPORTANT: If the USB cable is not correctly hooked up to the Radium, or the Radium is not switched on, setup will fail.

5. After OMS successfully finds the driver, "OMS Driver Setup" the Radium will appear in a list as "KEYSTATION SERIES". Click OK. OMS will then define the Radium output port (it will show "Identifying").
7. The "OMS MIDI Device Setup" dialog box will appear showing the Radium's output port (labeled KEYSTATION SERIES) with an open check box to the left of the port. You will now have to check this open box to enable the output port. Click on OK.
8. Next, the "My Studio Setup" appears with a file save dialog box over it. You will now need to name and save your new Studio Setup (or use the default name) before you can assign an instrument to the Radium's output (labeled KEYSTATION SERIES). Assign your instrument (this step is optional) and you are done.
9. Your Radium is ready for use.

You can run the OMS 'Test Studio' utility by going to the 'Studio' menu and releasing the mouse on "Test Studio." Playing a note on your keyboard will give you an audio message from your computer, "MIDI received," while the arrow pointing to the keyboard icon flashes. Clicking on the keyboard icon with the mouse pointer will send a tone cluster to the Radium output port. The sound module connected to the Radium MIDI Out port should play the chord.

You may now exit OMS Setup by quitting the application. The rest is up to configuration within your music software. Generally, this means selecting "OMS Compatibility," or "Open Music System" for your MIDI system setup.

Mac OS X

USB Driver Installation

The drivers for MacOS X are found on the Driver CD which comes with the product. You may also wish to check the MIDISPORT drivers page of our website to make sure you have the most recent version. The driver may be labeled "Keystation" or "M-Audio USB". The OSX Installer Package icon looks like a cube of Jello rising out of a cardboard box and usually ends with the suffix ".pkg".

To install the OSX driver:

1. Double-click on the installer package.
2. Click on the lock icon and enter the administrator password you chose when you installed OSX.
3. Follow the prompts to install the software.

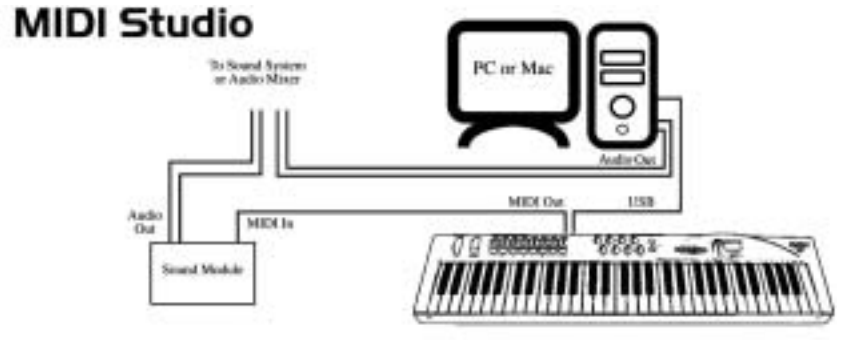
Your Radium is ready for use. Refer to the sections "Setting Up Your MIDI Studio" and "Using the KEYSTATION in your Application Software" for more information.

Setting Up Your MIDI Studio

A typical MIDI system set-up would include your Radium, a computer, MIDI sequencing software and/or a MIDI compatible sound module. This type of set-up can be connected as follows:

1. The Radium is connected to the computer via the USB port connectors, using the supplied USB standard cable.
2. The Radium can play the synthesizer that is part of an internal sound card, as well as any software synthesizers that are installed in your system. This will depend on how you set up your software (see the section "Using the Radium in Your Application Software"). The audio output of the sound card can be plugged directly into a sound system, or into a mixer, which is then connected to a sound system.
3. The MIDI Output of the Radium is connected to the MIDI In of a sound module. The audio output of the sound module can be plugged directly into a sound system, or into a mixer, which is then connected to a sound system.

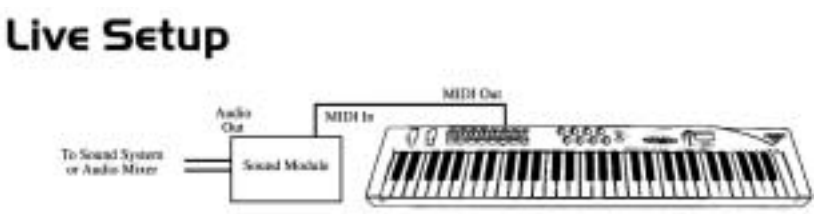
In the setup pictured below, the Radium is being used as a MIDI controller as well as a MIDI interface, inputting MIDI data to the computer and its application software, and outputting MIDI to a sound module from which sounds will be produced. The Radium as a controller may also send MIDI information to an existing internal soundcard's MIDI synthesizer or any installed software synthesizer, outputting the audio from the computer soundcard.



In this scenario, it may not be necessary to apply external power to the Radium. With the power switch set to "USB Power," the Radium receives power from the USB port on your computer. It is recommended that you plug directly into the USB port on the computer. You may also choose to use power from batteries (Radium49 only) or an external power supply.

Additionally, the Radium may be used as a "standalone" keyboard controller, independent of the computer and its USB port. In this case, the Radium must

receive power from a power supply, by switching the power setting on from the rear panel. Also, you will want to use the MIDI out port that is labeled "Keyboard." A setup such as this may be used in a performance situation, or when you wish to use the keyboard without the computer.



Using the Radium with Your Application Software

Once the Radium driver has been installed, you will need to configure your MIDI application software to utilize the Radium. The manner in which this is done varies between applications, so we can just cover the basics here.

Generally with both the Mac and PC, most MIDI applications have a MIDI port configuration or settings dialog box, sometimes called "MIDI Devices" or "MIDI Setup." It is within this dialog box that you will select or enable your MIDI input and output devices.

If the Radium drivers are properly installed, then the port selection in this case will be the KEYSTATION SERIES (or "Port 1" on the Mac) in the input column, and then KEYSTATION SERIES (or Port 1) in the output column. KEYSTATION SERIES will appear twice under the inputs and outputs. You must choose the second selection for each time it is listed in order for OMS to properly process the flow of MIDI information to and from the computer. Make sure that those items are highlighted or checked. The output port that you select on a specific MIDI track within your sequence will output MIDI information to the keyboard or sound module that is attached to that port.

MIDI Functions

MIDI is the acronym for Musical Instrument Digital Interface, which makes all digital musical instruments equipped with this standardized interface able to exchange their MIDI data or "talk to each other."

To explain how MIDI works on your instrument in more detail, the following descriptions outline the MIDI functions of the Radium, which allow you to connect the keyboard to other MIDI instruments and to your computer. The versatile MIDI capability of the Radium will offer you tremendous power in a MIDI environment.

The keys on the Radium, in conjunction with the MIDI/SELECT button, give you the extra programming capability that is unique to the Keystation series of MIDI controllers. You can use the Data Entry key to enter in values, or the keys that are labeled with numbers. The keys labeled for specific MIDI functions can be used to assign that function to the data slider. The "Set CTRL" key can be used with the numeric value keys to program the knobs and sliders to send MIDI controller information on specific MIDI channels.

Standalone Mode

To transmit MIDI data from your keyboard to other professional MIDI instruments, purchase a standard MIDI cable and use it to connect the MIDI OUT jack of your Radium labeled "Keyboard" to the MIDI IN jack of the other instrument.

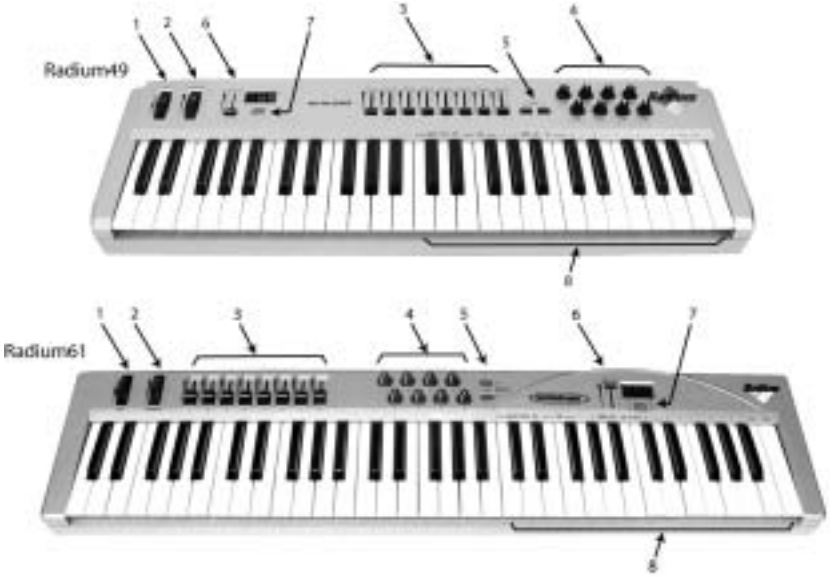
1. Power up the Radium using a 9VDC adapter. Set the power switch to the the 9vDC setting.
2. Make sure that the MIDI port "transmit" channel within you music application matches the MIDI "receive" channel of the other instrument.
3. Refer to the diagram in the section, "Setting Up Your MIDI Studio" for audio connections.

Default Settings

The Radium will select the following default parameter values when its power is first turned on.

- Default Transmit MIDI Channel number will be 1
- Default Octave will be from C4(60) to C6(84)
- Default After Touch value will be 0
- Default Velocity value will be 0
- Default Reverb Depth value will be 64
- Default Pan Pot value will be 64
- Default Volume value will be 127
- Default CC Data value will be 0
- Default Slider CC Data numbers are 20-27 on Channel 1Default Slider and Knob CC Data, refer to "Sliders and Knobs" section.
- Default Knob CC Data numbers are 70-77 on Channel 1
- Default CC Number value will be 0
- Default Control Change (CC-00=0, CC-32=0) message will be transmitted
- Default Program Change (PG=1) message will be transmitted

Operation Panel Features



1. **Pitch Bend Wheel:** The Pitch Bend wheel is used for raising or lowering the pitch of a voice during performance, starting from and always returning to a center "detent" point. The range of pitch values depends on the sound generator (sound card or module) being used. Please refer to the manuals of your devices for information on how to change the Pitch Bend range. To bend the pitch up, move the wheel away from you. To bend the pitch down, move the wheel towards you.
2. **Modulation Wheel:** It is very common to use the modulation wheel to change the intensity of effects, such as Vibrato (pitch change), Tremolo (change in volume), and Modulation (change in tone). The Modulation Wheel produces a vibrato effect shortly after the sound is generated, and is most effective for solo instruments such as saxophone, strings, and oboe. Similar to the pitch wheel, the actual effect and range of that effect will be set within your MIDI sound module.
3. **Controller Sliders:** These eight programmable sliders can be used to send any MIDI controller data on any MIDI channel. This is perfect for use with hardware and software synthesizers, for automating software mixers, or for controlling any devices that will respond to MIDI commands. In the next section, the "Set Controller Key" instructions will show you how to program this special feature.

4. **Controller Knobs:** Like the Controller Sliders, these eight programmable rotary knobs can be used to send any MIDI controller data on any MIDI channel. In the next section, the "Set Controller Key" instructions will show you how to program this special feature.
5. **Octave Up & Octave Down Buttons:** These buttons allow you to set the octave orientation of the Radium's keyboard.
6. **Data Entry Slider:** This slide controller allows you to adjust the value of parameters such as Volume, Velocity, Aftertouch, and virtually any assignable MIDI control parameter directly from your keyboard. Setting the data slider is covered in the next section.
7. **MIDI/SELECT button:** Use this button to select different MIDI commands using certain keys from your keyboard. Activating this key is indicated by a lit LED on the MIDI/Select button. When MIDI/SELECT is activated, the keyboard becomes a set of function keys for setting MIDI parameter commands.
8. **Programming Assignments Keys:** After pressing the MIDI/SELECT button, these keys on the Radium act as function keys which allow you to assign certain MIDI parameters and Program Change/MIDI Channel selections by the numbered key group.

Utilizing the Programming Assignment Keys

This section contains the information you will need to program the Radium and to send MIDI parameter data from the keyboard. You may set the data slider to send MIDI controller data of your choice, send program change data from the keyboard, select the MIDI transmit channel of the Radium, set the octave or pitch of the keyboard, and program the sixteen knob and slider controllers.

The Data Entry Slider

You may select the transmitting value of various MIDI functions (such as velocity offset, aftertouch, reverb depth, pan pot, volume, CC data) by pressing the MIDI/SELECT button followed by the key labeled with that MIDI function, then moving the DATA ENTRY slider to select the desired value. For example, if you want to change the value of the velocity offset, first press the MIDI/SELECT button, then the velocity key. Next, change the DATA ENTRY slider to the value you want and press the MIDI/SELECT button again to complete the change.

You can also assign any MIDI Controller to the DATA ENTRY slider, by using the controller's number.* This is done with the following steps.

1. Press the MIDI/Select button
2. Press the CC No. key
3. Press the number keys to select the desired MIDI Controller number
4. Press the Enter key
5. Press the MIDI/Select button to finish your selection.

*For a chart of MIDI Control Change values, see Appendix A of this manual.

The DATA ENTRY slider may be used to send MIDI controller information in real-time. When the Radium powers up, the DATA ENTRY slider defaults to a MIDI Controller value of 7 (Controller # 7 is MIDI volume). After a MIDI controller (such as velocity, aftertouch, pan, etc.) has been selected, by pressing one of the keys that represents the controller's function or the Controller #, the DATA ENTRY slider will immediately function to select the transmitted value of that specific controller when the slider is moved. This can be very useful for manipulating various functions during actual performance, mixing or recording, etc..

Assignable Sliders and Knobs

The Radium keyboard comes with 9 banks of factory presets. These presets work well with a variety of MIDI devices. The default assignments for the sliders and knobs which load when the Radium is powered on have been selected in order to work well with General MIDI instruments. They are listed in the following table:*

Preset #	Channel #	Contoller #	Definition	Application
(Sliders:)				
1	1	82	Attack	Filter
2	1	83	Decay	"
3	1	28	Sustain	"
4	1	29	Release	"
5	1	81	Filter Envelope	"
6	1	74	Cutoff	"
7	1	71	Resonance	"
8	1	2	Breath	Misc. Controls
(Knobs:)				
9	1	5	Glide Time	"
10	1	10	Pan	"
11	1	21	Pitch, Coarse	Oscillator
12	1	77	Pitch, Fine	"
13	1	16	Filter Rate	LFO
14	1	19	Filter Depth	"
15	1	18	Pitch Depth	"
16	1	80	Amp. Depth	"

*Refer to Appendix B of this manual for the information of the remaining preset banks.

Programming the Sliders and Knobs:

Pressing the MIDI/SELECT button and then the SET CTRL key will allow you to begin programming the controller sliders and knobs. In order to change the value of each slider (1 - 8) and knob (9 - 16), do as follows:

1. Press MIDI/SELECT, then the Set Controller key (marked "SET CTRL.)" The display will show a small "n" to indicate that the desired controller knob "number" should be entered next.
2. Choose the number of the desired controller slider or knob, using the number key group (1 - 16), then press the Enter key. The display will show a "P" in anticipation of the "parameter" number.
3. Assign the desired MIDI controller parameter number, using the number key group (1-127), then press Enter. (See the chart displayed in "Appendix A" fo this manual for a list of controller numbers.) The display will show a "C" in anticipation of the MIDI "channel" number.
4. Assign the MIDI channel number, using the number key group (1-16), then press Enter. This channel assignment will apply only to the controller knob that you are programming.

Finally, press the MIDI/SELECT key one more time, to finish assigning values to the controller sliders and knobs. You can program 15 sets of controls to the sliders and knobs and then switch between them using "presets" (see the paragraph titled "Presets:," contained within the following section).

Other Buttons and Keys

RESET Key: Pressing the MIDI/SELECT button, the RESET key, and then the Enter key will send out a message to send an "All Notes Off" message and return all external MIDI instruments to their default setting. This can be useful if notes on a synthesizer become "stuck" on. Press the MIDI/SELECT button again to return to the previous state.

"Flat" & "Sharp" Keys: By pressing the MIDI/SELECT button in combination with the flat and sharp keys, you can shift the active keyboard pitch higher or lower, one note (half-step) for each key press. For example, if you want to lower the pitch by 2 notes (two half-steps or a whole step), press the MIDI/SELECT button then the "flat" key twice. Press the MIDI/SELECT button to finish the change.

Octave Keys: To change the Radium's octave range, press the OCTAVE UP or OCTAVE DOWN button, according to your preference. The octave shift range available includes a maximum increment of plus or minus three octaves and the display will read "-3", "-2", "-1", "0" (for default), "1", "2" or "3", corresponding to the setting currently selected.

MIDI CHANNEL Key: By pressing the MIDI/SELECT button, then pressing the MIDI CHANNEL key, you select your keyboard's transmitting MIDI channel. The default channel will be 1 when the Radium's power is first turned on. To change this setting (for example, to set MIDI channel to Channel 2), do the following:

1. Press the MIDI/SELECT button.

2. Press the MIDI CHANNEL key.
3. Press the "2" key, then the Enter key. Lastly, press the MIDI/SELECT button one more time (this will change the MIDI transmit channel from 1 to 2.)

Number Keys: The Radium allows you to use the numeric keys instead of the DATA ENTRY slider to specify the Control Change parameter data. This is done by pressing the MIDI/SELECT button, CC (No. or Data) key, required number key(s), and the Enter key. As an example, to assign a Control Change value of 7, and CC Data value of 123:

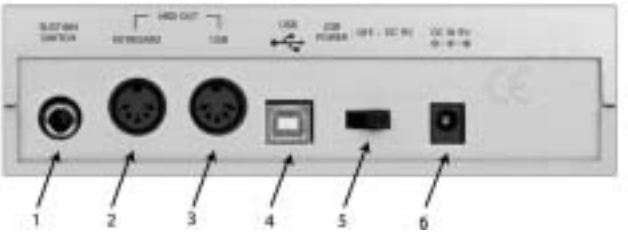
1. Press the MIDI/SELECT button.
2. Press the CC No. key.
3. Press the key labeled "7."
4. Press the Enter key, in order to specify the Control Change as 7.
5. Press the CC Data key.
6. Press the number keys 1, 2 and 3, in order.
7. Press the Enter key, to specify the value 123, then press the MIDI/SELECT button. This completes the process.

PROGRAM Key: By use of the MIDI/SELECT button and PROGRAM key, in combination with the numeric and ENTER keys, you can select any patch number between 1 and 128. This is done using the following sequence. If, for example, you want to change the voice to 67 (General MIDI TenorSax), press the MIDI/SELECT button and then the PROGRAM key. Now press numeric key number 6, then 7. Lastly, press the ENTER key, followed by the MIDI/SELECT button to finish the change.

> **NOTE: After pressing either the ENTER or CANCEL key, the LED display will show "—", and will not clear until you press the MIDI/SELECT button to finish your choice.**

Presets: The Radium can save fifteen Presets in memory. This allows you to assign 16 controller values to the sliders and knobs in one preset, then assign 16 different values to those same sliders and knobs, without losing the initial settings. To change to another Preset, press the MIDI/SELECT button and then the UP/DOWN buttons to choose one of the fifteen Presets. The display will read "P1" through "P15" while you are changing presets.

Rear Panel Features



1. **Sustain Jack -** This jack allows you to connect an optional footswitch to the keyboard. When the footswitch is depressed, notes played on the keyboard will continuously sound as long as the footswitch is held, while MIDI controller information is sent from the Radium.
2. **MIDI "Keyboard" Out Jack -** This standard MIDI jack is a direct MIDI out from the keyboard in "standalone" mode, and is used to send MIDI messages to another MIDI instrument (such as sound module).
3. **MIDI "USB" Out Jack" -** This standard MIDI jack receives its source from the computer when software is set to Radium MIDI Out, and is used to send MIDI messages to another MIDI instrument (such as sound module).
4. **USB Port -** This USB connector jack is used to connect the Radium to the computer's USB port using a standard USB cable (included).
5. **Power Switch -** The 3-way power switch selects the Radium's power mode—powered by USB connection, by external power supply or internal battery (6 size C - Radium49 only), or power off. When set to "USB Power" the Radium receives power only after the computer is powered on. When the Radium's power is turned on, the keyboard will reset to it's default settings.
6. **Power Jack -** This jack is used to connect the keyboard to an optional 9VDC, 500mA "wall-wart" type power supply.

Specifications

Model: Radium49 and Radium61 Keyboards

Keyboard Type	49 or 61 dynamic keys
Simultaneous Output	10 note (reverse priority)
Control Switches	Controller Knobs (8) Controller Sliders (8) MIDI Channel Reset Octave (-3, -2, -1, center , +1, +2, or +3) Program Change CC-00/CC-32 (GS Bank Selection) CC-No. (Generic CC Assignment) CC-Data Data Entry Velocity Assignment Data Entry Reverb Send Level Assignment Data Entry Chorus Send Level Assignment Pan Pot Assignment (CC-10) Volume Assignment (CC-07) Numerical Keys (x 10) Enter Cancel Pitch Bender Wheel Modulation Wheel Data Entry Slider
Rear Terminals	MIDI Out jacks (Kybd & Comptr - DIN) Sustain jack (1/4") USB port (to Comptr - pwr & MIDI) Power Select switch Power jack
Display Type	7-segment LED (x 3)
Dimensions, Radium61 " , Radium49	91.6 (cm) x 21.6 (cm) x 8.8 (cm) 75.0 (cm) x 23.7 (cm) x 6.6 (cm)
Weight, Radium61 " , Radium49	3.73 (kg) 3.0 (kg)
Power Source Options	External supply (9VDC, 500ma) USB Internal Battery (6C - Radium49 only)

Tested to comply with FCC Standards

For Home or Studio Use

MIDI Implementation Chart

Model: Radium49 and Radium61 keyboards

Function	Transmitted	Recognized	Remarks
Basic Channel			
Default	1	x	
Changed	1-16	x	
Mode			
Default	Mode 3	x	
Messages	x	x	
Altered	**********	x	
Note Number	12-108	x	With Octave Change
True Voice	**********	x	
Velocity			
Note ON	o	x	
Note OFF	x	x	
After Touch			
Key's	x	x	
Ch's	x	x	
Pitch Bender	o	x	
Control Change	o	x	
Prog Change			
:True #	1-128	x	
:CC-00,	**********	x	
:CC-32	0-127	x	
System Exclusive	x	x	
System Common			
:Song Pos	x	x	
:Song Sel	x	x	
:Tune	x	x	
System Real Time			
:Clock	x	x	
:Commands	x	x	
Aux Message			
:Local ON/OFF	x	x	
:All Notes OFF	o	x	Send with Reset.
:Active Sense	o	x	
:Reset	o	x	Send with Reset.
Notes			o=Yes, x=No

Radium Warranty

M-Audio warrants that this product is free of defects in materials and workmanship under normal conditions for 90 days, so long as the product is: owned by the original purchaser; the original purchaser has proof of purchase from an authorized M-Audio dealer; and the purchaser has registered his/her ownership of the product by sending in the completed warranty card.

In the event that M-Audio receives written notice of defects in materials or workmanship from such an original purchaser, M-Audio will either replace the product, repair the product, or refund the purchase price at its option. In the event any repair is required, shipment to and from M-Audio and a nominal handling charge shall be borne by the purchaser. In the event that repair is required, a Return Authorization number must be obtained from M-Audio. After this number is obtained, the unit should be shipped back to M-Audio in a protective package with a description of the problem and the Return Authorization clearly written on the package.

In the event that M-Audio determines that the product requires repair because of user misuse or regular wear, it will assess a fair repair or replacement fee. The customer will have the option to pay this fee and have the unit repaired and returned, or not pay this fee and have the unit returned unrepaired.

The remedy for breach of this limited warranty shall not include any other damages. M-Audio will not be liable for consequential, special, indirect, or similar damages or claims including loss of profit or any other commercial damage, even if its agents have been advised of the possibility of such damages, and in no event will M-Audio's liability for any damages to the purchaser or any other person exceed the price paid for the product, regardless of any form of the claim. M-Audio specifically disclaims all other warranties, expressed or implied. Specifically, M-Audio makes no warranty that the product is fit for any particular purpose.

This warranty shall be construed, interpreted, and governed by the laws of the state of California. If any provision of this warranty is found void, invalid or unenforceable, it will not affect the validity of the balance of the warranty, which shall remain valid and enforceable according to its terms. In the event any remedy hereunder is determined to have failed of its essential purpose, all limitations of liability and exclusion of damages set forth herein shall remain in full force and effect.

Appendix A - MIDI Controller Chart

Number	Definition	Parameter
0	Bank Select	0-127
1	Modulation Wheel	0-127
2	Breath Control	0-127
3	Undefined	0-127
4	Foot Controller	0-127
5	Portamento Time	0-127
6	Data Entry	0-127
7	Channel Volume	0-127
8	Balance	0-127
9	Undefined	0-127
10	Pan	0-127
11	Expression Controller	0-127
12	Effect Control 1	0-127
13	Effect Control 2	0-127
14	Undefined	0-127
15	Undefined	0-127
16	General Purpose Controller #1	0-127
17	General Purpose Controller #2	0-127
18	General Purpose Controller #3	0-127
19	General Purpose Controller #4	0-127
20-31	Undefined	0-127
32-63	LSB Controllers (0~31)	0-127
64	Damper Pedal on/off (sustain)	0-127
65	Portamento on/off	<63=off; >64=on
66	Sustenuto on/off	<63=off; >64=on
67	Soft Pedal on/off	<63=off; >64=on
68	Legato Footswitch	<63=off; >64=on
69	Hold 2	<63=off; >64=on
70	Sound Controller 1	0-127
71	Sound Controller 2 (Resonance)	0-127
72	Sound Controller 3 (Release Time)	0-127
73	Sound Controller 4 (Attack Time)	0-127
74	Sound Controller 5 (Cutoff)	0-127
75	Sound Controller 6 (Decay Time)	0-127
76	Sound Controller 7 (Vibrato Rate)	0-127
77	Sound Controller 8 (Vibrato Depth)	0-127
78	Sound Controller 9 (Vibrato Delay)	0-127
79	Sound Controller 10	0-127
80	General Purpose Controller #5	0-127
81	General Purpose Controller #6	0-127
82	General Purpose Controller #7	0-127
83	General Purpose Controller #8	0-127
84	Portamento Control	0-127
85-90	Undefined	0-127
91	Effects 1 Depth (Reverb Send Level)	0-127
92	Effects 2 Depth (Tremolo Depth)	0-127
93	Effects 3 Depth (Chorus Send Level)	0-127
94	Effects 4 Depth (Celeste Depth)	0-127
95	Effects 5 Depth (Phaser Depth)	0-127
96	Data Entry +1	n/a
97	Data Entry -1	n/a
98	Non-Registered Parameter Number LSB	0-127
99	Non-Registered Parameter Number MSB	0-127
100	Register Parameter Number LSB	0-127
101	Register Parameter Number MSB	0-127
102-119	Undefined	?
120	All Sound Off	0
121	Reset All Controllers	0
122	Local Controller on/off	0=off; 127=on
123	All notes off	0
124	Omni mode off (+ all notes off)	0
125	Omni mode on (+all notes off)	0
126	Monophonic Mode	0-16
127	Polyphonic Mode	0

Appendix B - Preset Banks

Please note that verification of MIDI controller information for listed synthesizers against manufacturer's published specifications may be necessary, as some manufacturers vary from the MIDI Manufacturer's Association standard referenced in this table.*

Preset		Slider								Knob								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1	Channel	1		1	1	1	1		1	1		1	1	1	1	1	1	
General MIDI	Controller	82	83	28	29	91	74	71	2	5	10	21	77	10	19	18	80	
	Definition	Attack	Decay	Sustain	Release	Filter Res.	Cutoff	Res.	Sustain	Glide Time	Pan	Mod. Depth	Pitch Bend	Rate	Pitch Depth	Pitch Depth	Amp Depth	
	Application																	
		Filter					Main Filter			Misc. Controls			Osc			LFO		
2	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Reason Synths	Controller	73	9	12	72	16	15	16	17	74	71	18	127	26	27	78	79	
	Definition	Attack	Decay	Sustain	Release	Attack	Decay	Sustain	Release	Cutoff	Res.	Env. Amount	Osc Mix	Cutoff	Res.	Rate	Amount	
	Application									Filter 1			Osc Mix	Filter 2			LFO 1	
		Amp Envelope					Filter Envelope											
3	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Reason	Controller	8	9	10	12	13	14	15	16	17	18	19	20	21	22	23	24	
Maxer	Definition	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7	Ch. 8	Ch. 9	Ch. 10	Ch. 11	Ch. 12	Ch. 13	Ch. 14	* unused, but set as for consistency		
	Application							Mixer Channels 1-14										
4	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Reason	Controller	8	9	10	14	15	14	15	16	17	18	81	82	83	84	85	86	
ReDrum	Definition	Vol 1	Vol 2	Vol 3	Vol 4	Vol 5	Vol 6	Vol 7	Vol 8	Vol 9	Vol 10	Pitch 1	Pitch 2	Pitch 3	Pitch 4	Pitch 5	Pitch 6	
	Application						Drum 1-10 Volume								Drum 1-4 Pitch			
5	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Generic	Controller	22	23	24	25	26	25	26	27	28	29	30	31	32	33	34	35	
	Definition																	
	Application						Generic							Generic				
6	Channel	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8
QW	Controller	7	7	7	7	7	7	7	7	7	10	10	10	10	10	10	10	10
Mixer A	Definition	Vol 1	Vol 2	Vol 3	Vol 4	Vol 5	Vol 6	Vol 7	Vol 8	Vol 9	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6	Pan 7	Pan 8
	Application						Volume 1-8								Pan 1-8			
7	Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
QW	Controller	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
Mixer B	Definition	Vol 1	Vol 2	Vol 3	Vol 4	Vol 5	Vol 6	Vol 7	Vol 8	Vol 9	Vol 10	Vol 11	Vol 12	Vol 13	Vol 14	Vol 15	Vol 16	
	Application									Volume 1-16								
8	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Al-84	Controller	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
Organ	Definition	16'	5-1/3'	8'	4'	2-2/3'	2'	1 3/5'	1-1/3'	1'	8 1/3'	4'		2 2/3'	2'	1 3/5'	1 1/3'	
	Application					Lower Manual 1-8								Upper Manual 1-8				
9	Channel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Waldorf	Controller	33	34	35	36	37	38	39	40	69	70	71	75	80	81	82	83	
Micro-Q	Definition	Osc FM	Osc Pitch	Key Hold Level	Key Hold Release	Osc 1 Octave	Osc 2 FM	Osc 2 Shape	Osc 2 Detune	Cutoff	Res.	Drive	FM	Cutoff	Res	Drive	FM	
	Application					Oscillator Section						Filter 1			Filter 2			

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